

Garden Math Project: Plan a Raised Bed

Area, volume, ratios, and money for grades 6 to 8

Name _____ Class _____ Date _____

The project. Your class is building a raised garden bed **8 feet long, 4 feet wide, and 1 foot deep**. Use math to find out how much lumber and soil to buy, what it will cost, and how many plants will fit. Show your work.

Part 1. Measure the bed

1. What is the area of the bed in square feet?

2. What is the perimeter of the bed in feet?

3. What is the volume of the bed in cubic feet?

Part 2. Buy the materials

Item	Price
8-foot board, 12 inches wide	$24.00 each
Bag of raised bed soil, 1.5 cubic feet	$8.99 each
Bulk soil delivered by the cubic yard (27 cubic feet)	$45.00 per cubic yard, sold in half-yards
Vegetable seedling	$4.00 each

4. Two boards make the long sides. The short sides are each 4 feet. How many 8-foot boards do you need, and what do they cost?

5. How many bags of soil do you need to fill the bed? (You can't buy part of a bag.) What do they cost?

6. How many cubic yards of bulk soil do you need, rounded up to the next half-yard? What does it cost? Which is the better buy, bags or bulk, and by how much?

Part 3. Plan by the square foot

In square foot gardening, each square foot holds a set number of plants.

Crop	Plants per square	Squares planned	Total plants
Tomatoes	1	4	
Peppers	1	4	
Lettuce	4	6	
Bush beans	9	6	
Carrots	16	4	
Total			

7. How many squares are left for other crops?

8. What is the ratio of carrots per square to lettuce per square, in simplest form?

9. You buy tomato and pepper seedlings and grow the rest from seed. What do the seedlings cost?

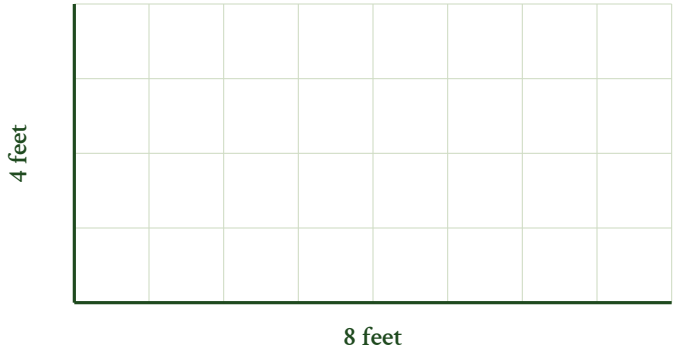
Part 4. Is it worth it?

10. Each tomato plant gives about 12 pounds of tomatoes, and tomatoes cost $3.50 a pound at the store. What are your tomatoes worth?

11. Add up the cost of the boards, the cheaper soil, and the seedlings. Do the tomatoes alone pay for the bed in the first year?

Part 5. Draw your plan

Each box is one square foot. Write the crop name or letter in each square.



Garden Math Project: Teacher Page and Answer Key

Standards: Common Core Math 6.G.A.1 and 6.G.A.2 (area and volume), 6.RP.A.3 (ratios and unit rates), 7.G.B.6 (real-world area and volume), 7.EE.B.3 (multi-step problems with money).

1. 8 × 4 = 32 square feet. **2.** 8 + 4 + 8 + 4 = 24 feet. **3.** 8 × 4 × 1 = 32 cubic feet.

4. 3 boards: two for the long sides, and one cut in half for the two 4-foot ends. 3 × $24 = $72.00.

5. 32 ÷ 1.5 = 21.3, so 22 bags. 22 × $8.99 = $197.78.

6. 32 ÷ 27 = 1.19 cubic yards, rounded up to 1.5 cubic yards. 1.5 × $45 = $67.50. Bulk is the better buy by $197.78 − $67.50 = $130.28.

Part 3 table: 4, 4, 24, 54, 64; total 24 squares and 150 plants.

7. 32 − 24 = 8 squares. **8.** 16 : 4 = 4 : 1. **9.** 8 seedlings × $4 = $32.00.

10. 4 × 12 = 48 pounds; 48 × $3.50 = $168.00.

11. $72.00 + $67.50 + $32.00 = $171.50. The tomatoes alone ($168.00) almost pay for the bed in the first year, and the lettuce, beans, carrots, and peppers are extra. The boards and soil last for years, so the bed costs much less in later years.

Note: prices are examples. For a real project, have students look up local prices, or use our free Raised Bed Soil Calculator at vegetable-gardening-online.com.